

Application No.: 09/843,573
Response to OA dated: September 7, 2005
Reply/Amendment dated: March 7, 2006

In the Drawings:

Enclosed herewith are replacement drawings sheets for Figures 1 through 4. Subject to the approval of the Examiner, Applicant respectfully requests that the original drawing sheets be replaced with those enclosed herewith. Applicant respectfully submits that the replacement drawing sheets correct informalities in the drawings as originally filed, and that no new matter is being added.

In the Claims:

Please amend Claims 1 and 8-10; cancel Claims 18 and 24; and add new Claims 25-27, all as shown below. Applicant respectfully reserves the right to prosecute any originally presented or canceled claims in a continuing or future application.

1. (Currently Amended) A method of simultaneously optimizing performance characteristics in circuit synthesis, comprising the steps of:

(a) receiving an initial set of design parameters for a circuit to be synthesized;

(b) invoking a simulation script to determine which synthesis models should be used with the circuit and to set ranges for any test benches;

(a) (c) generating [[a]] sets of circuit parameters for each performance characteristic of [[a]] the circuit;

(d) automatically creating a plurality of test benches, wherein each of the plurality of test benches emulates test circuitry external to the circuit;

(b) (e) simultaneously passing in parallel each said set of circuit parameters through a respective circuit model as specified by the simulation script, wherein additional multiple sets of circuit parameters may be are passed at the same time in parallel;

(f) simultaneously running in parallel a simulation of each said circuit model on [[an]] the plurality of analysis test benches in order to measure performance of said the circuit model using said the set of circuit parameters, each said analysis test bench adapted to model circuitry external to said circuit and control the type of analysis to be performed for each said performance characteristic of said circuit; and;

(h) (g) optimizing the circuit synthesis, including receiving the performance measurements for each simulation at an optimizer and determining for which performance characteristics the a specifications are met, and, for those analyses where the specifications are not met then generating new circuit parameter values and repeating steps (a) (c) through (d) (g); and

(h) outputting the final set of circuit parameters for the circuit.

2. (Original) A method according to claim 1, further comprising the step of receiving the measurements of performance for each simulation in an optimizer, said optimizer adapted to determine whether specifications were met for said simulation.
3. (Original) A method according to claim 2, further comprising the step of generating new set of circuit parameter values in said optimizer.
4. (Original) A method according to claim 3, further comprising the step of passing said new set of circuit parameter values through the respective said circuit model.
5. (Original) A method according to claim 1, further comprising the step of assigning each said analysis to a separate processor for parallel processing.
6. (Original) A method according to claim 1, further comprising the step of checking a lookup database for previously optimized performance characteristics.
7. (Original) A method according to claim 1, further comprising the step of saving optimized performance characteristics to a lookup database.
8. (Currently Amended) A method according to claim 1, further comprising the step of setting up ranges for each said analysis test bench and providing ~~design~~ circuit parameters using a simulation script.
9. (Currently Amended) A method according to claim 1, further comprising the step of mapping the function of a ~~design~~ circuit parameter to a performance characteristic.
10. (Currently Amended) A simulation system for simultaneously optimizing performance characteristics in circuit synthesis, comprising:
 - (a) an initial set of design parameters for a circuit to be synthesized;

(b) a simulation script that determines which synthesis models should be used with the circuit, generates sets of circuit parameters for each of a plurality of performance characteristics, and sets ranges for any test benches;

~~(b)~~ (c) at least one circuit model for incorporating said set of ~~design circuit~~ parameters, each said circuit model adapted to model a portion of said circuit pertaining to a performance characteristic, wherein additional sets of circuit parameters may be passed at the same time in parallel;

~~(c)~~ (d) a plurality of test benches that are created automatically in response to invoking the simulation script, wherein each of the plurality of test benches emulates test circuitry external to the circuit ~~at least one analysis test bench connected to each said circuit model, each said analysis test bench adapted to model circuitry external to said circuit and control the type of analysis to be performed for each said performance characteristic of said circuit; and~~

~~(d)~~ (e) an optimizer that simultaneously passes in parallel each set of circuit parameters through a circuit model as specified by the simulation script, and determines for which performance characteristics the specifications are met, and, for those analyses where the specifications are not met then generating generates new parameter values and repeating repeats the simulation with the new parameter values.

11. (Original) A simulation system according to claim 10 additionally comprising an optimizer adapted to collect the results of said analysis of each said analysis test bench and compare said results to optimal performance specifications for said circuit.

12. (Original) A simulation system according to claim 11, wherein said optimizer comprises an optimization algorithm.

13. (Original) A simulation system according to claim 12, wherein said optimization algorithm is adapted to generate parameter values to be passed to each said analysis test bench.

14. (Original) A simulation system according to claim 10, further comprising a simulator for each said analysis test bench.
15. (Original) A simulation system according to claim 10, wherein each said analysis test bench is adapted to run multiple occurrences of said analysis for each said circuit.
16. (Original) A simulation system according to claim 10, wherein said analysis may be performed over multiple operating conditions.
17. (Original) A simulation system according to claim 16, wherein said multiple operating conditions are selected from the group consisting of temperature, supply voltage, and fabrication process.
18. (Canceled).
19. (Original) A simulation system according to claim 10, further comprising a processor for each said circuit model.
20. (Original) A simulation system according to claim 10, further comprising at least one simulation script for each said circuit model.
21. (Original) A simulation system according to claim 10, further comprising a synthesis plan adapted to set out rules for said analysis.
22. (Original) A simulation system according to claim 10, further comprising a lookup database.
23. (Original) A simulation system according to claim 22, wherein said lookup database includes a set of performance specifications for each said circuit model.

24. (Canceled).

25. (New) A method of simultaneously optimizing performance characteristics in circuit synthesis, comprising the steps of:

- (a) receiving an initial set of design parameters for a circuit to be synthesized;
- (b) invoking a simulation script to determine which synthesis models should be used with the circuit and to set ranges for any test benches;
- (c) generating a set of circuit parameters for each performance characteristic of the circuit;
- (d) automatically creating a plurality of test benches, wherein each of the plurality of test benches emulates test circuitry external to the circuit;
- (e) simultaneously passing in parallel each of set of circuit parameters through a respective circuit model as specified by the simulation script;
- (f) simultaneously running in parallel a simulation of each circuit model on the plurality of test benches in order to measure performance of said circuit model using said set of circuit parameters;
- (g) optimizing the circuit synthesis, including receiving the performance measurements for each simulation and determining for which performance characteristics the specifications are met, and, for those analyses where the specifications are not met then generating new circuit parameter values and repeating steps (c) through (g); and
- (h) outputting the final set of circuit parameters for the circuit.

26. (New) The method of claim 1, wherein the method further includes, during the simulation of each circuit model on the plurality of test benches, checking out a license for each test bench being used from a pool of available simulation licenses.

27. (New) The method of claim 25, wherein the method further includes, during the simulation of each circuit model on the plurality of test benches, checking out a license for each test bench being used from a pool of available simulation licenses.